IN THE CLAIMS:

The claims have been amended as follows:

1. (Currently Amended) A beam control system comprising:

first means for providing a first beam of electromagnetic energy;

second means for sampling said first beam at an output of said first means and providing a second beam in response thereto;

third means for detecting aberrations in said second beam; and

fourth means, responsive to said detected aberrations, for correcting aberrations in said first beam, said fourth means including adaptive optical means with a phase conjugate amplifier beamline for ~~generating a phase conjugate laser beam as~~ predistorting said first beam to correct for said aberrations.

2. (Original) The invention of Claim 1 wherein said first means includes a beam director.

3. (Original) The invention of Claim 2 wherein said beam director is a telescope.

4. (Original) The invention of Claim 3 wherein said telescope includes a primary mirror.

5. (Original) The invention of Claim 4 wherein said second means includes a holographic optical element.

6. (Original) The invention of Claim 5 wherein said holographic optical element is disposed on a surface of said primary mirror of said telescope.

7. (Canceled)

8. (Previously Amended) The invention of Claim 1 wherein said third means is a wavefront sensor adapted to detect said aberrations in said second beam and provide a first error signal in response thereto.

9. (Original) The invention of Claim 8 wherein said fourth means includes a processor adapted to generate a correction signal in response to said error signal.

10. (Original) The invention of Claim 9 further including means for generating a reference beam.

11. (Original) The invention of Claim 10 further including means for modifying said reference beam in response to said correction signal.

12. (Original) The invention of Claim 11 wherein said means for modifying is an optical phased array.

13. (Original) The invention of Claim 11 further including means for conjugating the phase of said reference beam and providing said first beam in response thereto.

14. (Original): The invention of Claim 13 further including an aperture sharing element disposed in alignment with said means for conjugating.

15. (Original) The invention of Claim 14 wherein said modified reference beam is adapted to read a first surface of said aperture sharing element and provide a back side read beam in response thereto.

16. (Original) The invention of Claim 15 wherein said means for conjugating includes a first phase conjugate mirror adapted to conjugate the phase of said back side read beam and provide a conjugated back side read beam in response thereto.

17. (Original) The invention of Claim 16 wherein said means for conjugating includes a second phase conjugate mirror adapted to conjugate the phase of said back side read beam and provide said back side read beam in response thereto.

18. (Previously Amended) The invention of Claim 16 further including means for amplifying said back side read beam output by said second phase conjugate mirror to provide said first beam.

19. (Original) The invention of Claim 18 wherein said first beam is reflected by a front surface of said aperture sharing element.

20. (Previously Amended) A beam control system comprising:

a telescope having a primary mirror;

a holographic element disposed on said primary mirror;

a wavefront sensor in optical alignment with said holographic optical element;

a processor operatively coupled to said wavefront sensor;

an optical phased array operatively coupled to said processor;

an aperture sharing element;

a source of a reference beam adapted to illuminate said phased array and said aperture sharing element;

a first phase conjugate mirror in optical alignment with said reference beam;

a second phase conjugate mirror in optical alignment with said reference beam; and

an amplifier in optical alignment with said second phase conjugate mirror.

21. (Canceled)